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**From:** Subramaniam, Ravi [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E738F9D27062486E9047184B867FD968-SUBRAMANIAM, RAVI]  
**Sent:** 3/9/2016 1:53:30 PM  
**To:** Gary Ginsberg [Gary.Ginsberg@po.state.ct.us]  
**Subject:** FW: fyi - my "hip pocket" slides re endogenous  
**Attachments:** Bussard - endogenous.pptx

Not sure which address works for you.

--Ravi.

Ravi Subramaniam, PhD / Chief (acting), Toxic Effects Branch-IRIS, NCEA-ORD, EPA.  
Room N7873/ Ph: (703) 347-8606 (o), (571) 305-3601 (m)

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**From:** Subramaniam, Ravi  
**Sent:** Wednesday, March 09, 2016 8:51 AM  
**To:** Gary Ginsberg <Gary.Ginsberg@po.state.ct.us>  
**Cc:** Bussard, David <bussard.david@epa.gov>  
**Subject:** FW: fyi - my "hip pocket" slides re endogenous

Gary:

David had made very insightful observations regarding the "homeostatic" endogenous issue. Normally I would ask him before sending, but given the move and the short time frame I am sharing it with you (see attached). Another point he had made was that while homeostatic mechanisms may be argued as a buffer against acute responses, they might plausibly work the other way when it comes to chronic disease. Examples he cited for me: a) homeostatic mechanisms that control acute fluctuations in blood glucose may do harm for a chronic disease like diabetes; b) cholesterol levels in cells might be controlled at the cost of increasing blood cholesterol levels (which in turn lead to cardiac disease); c) DNA repair may be seen as a homeostatic mechanism. Prone to errors which lead to mutations and long-term disease.

--Ravi.

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**From:** Bussard, David  
**Sent:** Tuesday, December 08, 2015 2:45 PM  
**To:** Subramaniam, Ravi <[Subramaniam.Ravi@epa.gov](mailto:Subramaniam.Ravi@epa.gov)>  
**Subject:** fyi - my "hip pocket" slides re endogenous

Ravi,

Given your involvement when we looked at the Starr paper, I thought you might be interested in this attempt on slide 3 to visually lay out one idea.

David A Bussard  
Director, Washington Division  
National Center for Environmental Assessment, NCEA

ORD, USEPA